

SISYMBRIUM BRACHYCARPON AND ALLIES.

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DR. EZRA BRAINERD recently sent to the Gray Herbarium for examination some specimens of a *Sisymbrium* collected both in Vermont and New York on the borders of Lake Champlain. These were evidently referable to *S. canescens* Nutt. var. *brachycarpon* (Richards) Wats. as treated in Gray's Manual, Seventh Edition. An examination of the large amount of material now available has led to the conclusion that this plant is specifically distinct from the mostly more southern *S. canescens*. The decidedly greener hue, more deeply segmented leaves, and remote simple viscid or glandular trichomes on the stems toward or quite to the base are characters that seem constant enough over a large area to justify its separation. The southern plant reaches its typical development in the southeastern states, and there is canescent with a soft rather coarse stellate pubescence, especially toward the base, the leaf-segments are short and rounded, and glandulosity, if present, is either confined to the upper portions of the plant or mingled with the pubescence, never standing out as simple distinct trichomes as in *S. brachycarpon*.

Dr. Rydberg, Fl. of Col. 158, gives as a character of *Sophia pinnata* (*S. canescens*), "style obsolete," and in Bull. Torr. Club, xxxiv. 436, after describing *Sophia magna*, writes, "It was first mistaken for *S. brachycarpa*; but the style is evident although short." If we must delimit these species to this extent the above treatment is not correct but it does not seem probable that it will ever be necessary or feasible to sort out *Sisymbrium* specimens, that agree in every other respect, by this method. The style is usually so minute that the question as to whether it is obsolete or evident is of little moment, especially since its relative development seems quite impossible of correlation with the more constant and certainly more striking differences indicated in the preceding paragraph.

Both *S. canescens* and *S. brachycarpon* undergo various modifications when they reach the prairie states and the Rocky Mountains. Without any attempt to clear up the almost inconceivable confusion that involves the numerous segregate species proposed in the West, one or two facts appear reasonably evident and therefore are presented now.

S. brachycarpon, particularly in the central-southern Rocky Mountains tends to have on the lower part of the stem a fine stellate puberulence which persists even after the plant has matured fruit. This variation forms part of *Sophia intermedia* Rydb., some specimens having this character being labeled by Dr. Rydberg as belonging to his species. However, *S. intermedia*, as originally described, included Montana specimens quite referable to *S. brachycarpon* and entirely inseparable from typical collections of that species from the northeastern states. The more southern permanently puberulent material, included in the former species by its author, connects the latter species with *S. canescens* on account of its more marked pubescence. Its leaves, however, definitely ally it to *S. brachycarpon*. By placing a limited interpretation on *S. intermedia* Rydb., letting it include only those plants with the more permanent pubescence, it is possible to dispose of a considerable number of collections from the Rocky Mountains that otherwise would have to be referred to *S. brachycarpon* or to *S. canescens* where they would be, in either case, decided misfits. I think, however, that the facts will be more clearly indicated if this plant is regarded as a variety of its nearer relative rather than as a species equally distinct from both.

There is another variation which, unless treated as a species, has been kept as a variety of a plant which is obviously not its nearest relative. This is *S. incisum* Engelm. var. *filipes* Gray, which has the comparatively short clavate pods with the seeds more or less in two rows as in the *S. canescens* group, as pointed out by Dr. Rydberg, Fl. of Col. 157 and Mem. N. Y. Bot. Gard. i. 185. In foliage it is not unlike *S. brachycarpon* except the upper leaf-segments tend to become elongate. The stems are glabrous or slightly cinereous with a minute stellate puberulence. It must, therefore, be regarded as a variety of *S. brachycarpon* rather than of *S. incisum*, a species well marked by its very narrow pods with strictly uniserial seeds.

The plants here discussed may be summarized as follows.

- Pods very slender; seeds strictly 1-ranked in each cell....1. *S. incisum*.
- Pods clavate or subclavate; seeds more or less 2-ranked in each cell.
- Plant canescent with a soft stellate- or branched-pubescence; pinnules short and rounded.....2. *S. canescens*.
- Plant green or cinereous below with a fine stellate puberulence; pinnules, at least mostly, elongate and slender.
- Leaf-segments of about uniform length; fruiting pedicels usually less than 1.5 cm. long.
- Glabrate or stellate-puberulent below when young; more or less glandular with simple viscid trichomes toward or quite to the base of the stem.....3. *S. brachycarpon*.

Stellate-puberulent below, rarely throughout, even in age; not glandular toward the base. 3a. var. *intermedium*.
Terminal, and sometimes upper-lateral, leaf-segments much longer than the others and mostly entire; fruiting pedicels often more than 1.5 cm. long. 3b. var. *filipes*.

1. *SISYMBRIUM INCISUM* Engelm. ex Gray, Pl. Fendl. 8 (1849). Not so common as is generally supposed, a large number of specimens so referred belonging to *S. Sophia* or even to the *S. canescens* group.
2. *SISYMBRIUM CANESCENS* Nutt. Gen. ii. 68 (1818). *S. pinnatum* Walt.) Greene, Bull. Calif. Acad. Sci. ii. 390 (1887), not *S. pinnatum* Barneoud ex C. Gay, Fl. Chile, i. 125. (1845). Specimens examined. SOUTH CAROLINA: in sand, Isle of Palms, Harbor of Charleston, May 2, 1912, B. L. Robinson (122). GEORGIA: St. Mary's, Feb. 1873, C. E. Faxon. FLORIDA: sandy seashore, Hillsborough Co., March 5, 1905, A. Fredholm (6504); weed in cultivated ground, Duval Co., March 20, 1912, A. Fredholm (5001); east Florida, D. C. Eaton; South Jacksonville, April 8, 1897, J. R. Churchill; cultivated ground near Jacksonville, March 22, 1898, A. H. Curtiss (6352). OKLAHOMA: sand, Ingersoll, May 6, 1902, B. F. Bush (1506). TEXAS: along Corpus Christi Bay, March 21, 1894, A. A. Heller (1470); sand, Columbia, March 27, 1900, B. F. Bush (450); Limpia Canyon, April 25, 1902, Tracy & Earle (244). NEW MEXICO: 1847, A. Fendler (32). ARIZONA: Tuscon, Feb. 27, 1907, F. E. Lloyd. CALIFORNIA: Antelope Valley, Sept.-Oct. 1878, J. C. Phillips & C. S. Sargent; Panamint Mts., Inyo Co., March 30, 1891, Coville & Funston (512). WASHINGTON: 1889, G. R. Vasey (180).
3. *SISYMBRIUM BRACHYCARPON* Richards. Frankl. 1st Journ. Appendix Ed. 1. 744 (1823). *S. canescens* Nutt. var. *brachycarpon* (Richards) Wats. Bibl. Index N. A. Bot. 69 (1878); *Sophia intermedia* Rydb. Mem. N. Y. Bot. Gard. i. 184 (1900) in part (see discussion above). Specimens examined. QUEBEC: sandy border of salt-marsh near mouth of River Ste. Anne Des Monts, Aug. 3-17, 1905, J. F. Collins & M. L. Fernald. MAINE: N. Berwick, May 29, 1902, J. C. Parlin (1462). VERMONT: rocky soil, Hog Back Island, Lake Champlain, July 22, 1900, Nellie F. Flynn. NEW YORK: cliffs along Lake Champlain, Port Henry, June 13, 1882, Ezra Brainerd; Garden Island, Lake Champlain, Aug. 1892, Ezra Brainerd; cliffs of Lake Champlain, near Westport, May 6-June 13, 1878, C. G. Pringle; Crown Point, May 28, Aug. 12, 1901, W. W. Eggleston (2552). ONTARIO: Kingston, June 9, 1902, J. Fowler; sand, Pelee Point, Lake Erie, May 27, 1901, John Macoun (33, 857). OHIO: Sandusky, May 31, 1903, W. A. Kellerman, TENNESSEE: rich bluffs, Knoxville, May 15, 1896, Albert Ruth (346). MICHIGAN: shore of Thunder Bay Island, June 18, 1895, C. F. Wheeler; Presque Isle, Houghton; Belle Isle in Detroit River, June 1898-1900, O. A. Farwell. WISCONSIN: Benderville, Brown Co., June 9, 1901, J. H. Vehnente. ILLINOIS: dry prairies, Decatur, May 4, 1897, H. Allan Gleason (254); Leithon, Lake Co., July 1, 1907, F. C. Gates (1717.4);

dry sandy soil, Peoria, June 1904, *F. E. McDonald*; dry clay soil, Mahomet, May, 1901, *H. Allan Gleason* (2379). MINNESOTA: Fort Snelling, June 1, 1891, *Edgar A. Mearns*. IOWA: Armstrong, May 26, 1897, *K. I. Cratty*. MISSOURI: dry woods, Cockerell, May 21, 1912, *B. F. Bush* (6714); Monteer, May 16, 1901, *B. F. Bush* (490). ARKANSAS: sand, Miller Co., April 27, 1902, *B. F. Bush* (1444). NORTH DAKOTA: railroad banks, Leeds, May 24 & June 25, 1901, *Dr. J. Lunell*. KANSAS: sterile ground, Riley Co., 1896, *J. B. Norton* (615); Osborne City, May 19, 1894, *C. L. Shear* (32). OKLAHOMA: along river, Muskogee, April 7, 1908, *Ezra Brainerd*. TEXAS: Dallas Co., April 3, 1901, *J. Reverchon* (2729). ASSINIBOIA: Crane Lake, June 20, 1894, *John Macoun* (3086); Milk River, July 13, 1895, *John Macoun* (10,333). MONTANA: Spanish Creek, May 8, 1901, *J. Vogel*; Bridger Mts., June 11, 1897, *Rydberg & Bessey* (4200); Bozeman, May 20, 1901, *W. W. Jones*. WYOMING: dry soil, Leucite Hills, June 17, 1901, *Merrill & Wilcox* (700). COLORADO: Mancos, June 24, 1898, *Baker, Earle & Tracy* (86); Cimarron, June 7, 1901, *C. F. Baker* (64). OREGON: near Grizzly Butte Camp, June 19, 1894, *J. B. Leiberg* (301). WASHINGTON: Yakima Co., May, 1892, *L. F. Henderson* (2379); Waitsburg, April 28 & May 18, 1897, *R. M. Horner* (77).

3a. *SISYMBRIUM BRACHYCARPON* Richards. var. **intermedium** (Rydb.), n. comb. *Sophia intermedia* Rydb. Mem. N. Y. Bot. Gard. i. 184 (1900) in part (see above discussion). Specimens examined. IDAHO: dry slopes, Hot Hole, East Fork Bruneau, Owyhee Co., July 3, 1912, *Nelson & Macbride*, (1888). WYOMING: Marquette, Aug. 4, 1893, *J. N. Rose* (117); waste ground, Bates Creek, Natrona Co., July 4, 1901, *Leslie N. Goodding* (195) (TYPE); U. S. Penitentiary Reservation, June 16, 1894, *Aven Nelson* (247). COLORADO: dry valley lands, Paradox, Montrose Co., June 17, 1912, *E. P. Walker* (100); Salida, June 19, 1898, *Baker, Earle & Tracy* (16). NEVADA: Carson City, Ormsby Co., June 3, 1902, *C. F. Baker* (970); among the Creosote bushes, Cane Springs, April 6, 1905, *Leslie N. Goodding* (2159); sandy draws, Meadow Valley Wash, April 7, 1905, *Leslie N. Goodding* (2167); Calientes, May 23, 1902, *Leslie N. Goodding* (926).

3b. *SISYMBRIUM BRACHYCARPON* Richards. var. **filipes** (Gray), n. comb. *Sisymbrium incisum* Engelm., var. *filipes* Gray Pl. Fendl. 8. (1849). Specimens examined. SASKATCHEWAN: Touchwood Hills, July 16, 1906, *Macoun & Herriot* (70, 174). IDAHO: dry sagebrush slopes, Twin Falls Co., June 25, 1912, *Nelson & Macbride* (1704). MONTANA: near Pony, July 6, 1897, *Rydberg & Bessey* (4197). WYOMING: Red Desert, Sweetwater Co., June 1, 1897, *Aven Nelson* (3078). NEVADA: Washoe Co., Hunter Creek Canyon, May 24, 1912, *A. A. Heller* (10401). OREGON: Clear Water, *Rev. Spalding* (TYPE). WASHINGTON: Wawawai, May 13, 1893, *C. V. Piper* (1477).

GRAY HERBARIUM.